REMARKS

Claims 10, 13 to 21 and 23 to 28 are pending in this application, of which claims 10, 19 and 25 are the independent claims. Favorable reconsideration and further examination are respectfully requested.

The Examiner rejected claims 10 and 15-18 under 35 U.S.C. § 102(e) over U.S. Patent Application Pub. No. US 2005/0194619 ("Edelstein"). As amended, claim 10 recites a dielectric comprising a carbon doped oxide (CDO) film having a modulus of about 11.5 GPa or greater, and a CDO film having a dielectric constant less than about 3, wherein the dielectric has an open pore structure.

Edelstein is not understood to disclose or to suggest at least the foregoing features of claim 10. In this regard, Edelstein discloses a SiCOH dielectric material with a dielectric constant of exactly 3.0 and a modulus greater than 15 (Edelstein, paragraphs [0022] and [0053]). Edelstein, however, differentiates between such a dielectric material with regards as to whether or not the material is porous:

> As stated above, the present invention provides dielectric materials (porous or dense, i.e., non-porous) that comprise a matrix of a hydrogenated oxidized silicon carbon material (SiCOH) comprising elements of Si, C, O and H in a covalently bonded tri-dimensional network and have a dielectric constant of about 3.2 or less. [Edelstein, Paragraph [0047]]
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> The SiCOH dielectric material of the present invention optionally contains molecular scale voids (i.e., nanometer-sized pores) between about 0.3 to about 10 nanometers in diameter, and most preferably between about 0.4 and about 5 nanometers in diameter, which further reduce the dielectric constant of the SiCOH dielectric material. The nanometer-sized pores occupy a volume

> between about 0.5% and about 50% of a volume of the material. When these voids are present, the material is known as porous SiCOH or "pSiCOH". [Edelstein, Paragraph [0051]]

Note that Edelstein differentiates specifically between "porous SiCOH" and dense "SiCOH" in paragraph [0051]. Edelstein, while allowing for the possibility of the dielectric containing pores, is clearly not describing an open pore structure, in which the pore structure is characterized by interconnecting pore channels. Edelstein, in stating that "[t]he SiCOH dielectric material ... optionally contains molecular scale voids (i.e., nanometer-sized pores) between about 0.3 to about 10 nanometers in diameter...", neither describes nor suggests an open pore structure. Further, Edelstein also states:

> In some embodiments of the present invention, the inventive dielectric material is characterized has (i) being dense or porous and having a cohesive strength in a dry ambient, i.e., the complete absence of water, greater than about 3 J/m^2 and a dielectric constant less than about 2.5, (ii) being dense or porous and having a cohesive strength greater than about 3 J/m^2 at a water pressure of 1570 Pa at 25° C. and a dielectric constant less than about 3.2 (50% relative humidity), or (iii) being dense or porous and having a cohesive strength greater than about 2.1 J/m^2 at a water pressure of 1570 Pa at 25° C. and a dielectric constant less than about 2.5. [Edelstein, Paragraph [0056]]

Note that, although Edelstein allows for porous SiCOH, he fails to provide a range for the elastic modulus or hardness. Rather, he is concerned about the relationship between dielectric constant and cohesive strength in different ambient conditions.

Nevertheless, Edelstein does state ranges for the elastic modulus and hardness:

> In a first embodiment of the present invention, a stable ultra low k SiCOH dielectric material is provided that has a dielectric constant of 3.0, a tensile stress of 30 MPa or less, an elastic

> modulus greater than 15 GPa, cohesive strength greater than about 6 J/m^2, a crack development velocity in water of not more than 1.times.10^{-10} m/sec for a film thickness of 3 microns, and a fraction of the C atoms are bonded in the functional group Si--CH_2--Si, wherein said methylene, CH_2 carbon fraction is about 0.1 is provided.
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> In a second embodiment of the present invention, a stable ultra low k SiCOH dielectric material is provided that has a dielectric constant of less than 2.5, a tensile stress of from about 30 to about 40 MPa or less, an elastic modulus greater than 5 GPa, a cohesive strength greater than about 4 J/ m^2, a crack development velocity in water of not more than 1.times.10^{-10} m/sec for a film thickness of 3 microns, and a fraction of the C atoms are bonded in the functional group Si--CH_2—Si…[Edelstein, Paragraphs [0053]-[0054]]

From Edelstein's language in paragraph 51, it is clear that Edelstein is referring to dense, rather than porous, SiCOH. Nevertheless, assume *arguendo* that Edelstein meant to include porous SiCOH as having the combination of ranges for the dielectric constant and elastic modulus as stated in paragraphs [0053] or [0054]. Even in this case, which Applicant does not concede is the case, Edelstein fails to describe or suggest a dielectric having an open pore system, as recited in claim 10. For at least the foregoing reason, claim 10 is believed to be patentable over Edelstein.

The Examiner rejected claims 19-21, 23, and 24 under 35 U.S.C. § 102(e) over Edelstein. As amended, claim 19 recites a dielectric comprising a carbon doped oxide (CDO) film having a hardness in a range of about 1.9 GPa to about 3.3 GPa, and not less than about 1.9 GPa, wherein the dielectric has an open pore structure.

Edelstein is not understood to disclose or to suggest at least the foregoing features of claim 19. In this regard, Edelstein discloses a SiCOH dielectric material with a hardness from about 0.2 to about 2.0 GPa (Edelstein, paragraph [0071]). Again, Edelstein neither describes nor

suggests an a dielectric having an open pore structure, as required by claim 19. For at least the foregoing reason, claim 19 is believed to be patentable over Edelstein.

The Examiner rejected claim 25 under 35 U.S.C. § 102(e) over Edelstein. As amended, claim 25 recites a dielectric comprising a carbon doped oxide (CDO) film having a hardness of greater than or equal to, but not less than, about 1.9 GPa and a modulus of greater than or equal to, but not less than, about 11.5 GPa, wherein the dielectric has an open pore structure.

Edelstein is not understood to disclose or to suggest at least the foregoing features of claim 25. In this regard, Edelstein discloses a SiCOH dielectric material with a hardness from about 0.2 to about 2.0 GPa (Edelstein, paragraph [0071]), which allows for a hardness of less than about 1.9. As demonstrated *supra*, Edelstein neither describes nor suggests a dielectric having an open pore structure, as required by claim 19. For at least the foregoing reason, claim 25 is believed to be patentable over Edelstein.

The Examiner rejected claims 13 and 14 under 35 U.S.C. § 103(a) over Edelstein. Because claims 13 and 14 depend from claim 10, claims 13 and 14 are believed to be patentable over Edelstein for the reason stated *supra*.

Each of the dependent claims is also believed to define patentable features of the invention. Each dependent claim partakes of the novelty of its corresponding independent claim and, as such, has not been discussed specifically herein.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or

other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

In view of the foregoing amendments and remarks, Applicant respectfully submits that the application is in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney can be reached at the address shown below. All telephone calls should be directed to the undersigned at 617-521-7896.

Enclosed is a Request for Continued Examination and an Information Disclosure Statement. The fees in the amount of $810 are being paid concurrently on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other required fees to deposit account 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

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